Figure DR1: Strike directions obtained from singular value decomposition of magnetotelluric impedances (after Caldwell et al., 2004). Period on the vertical axis corresponds to depth. In blanked areas, the phases of the principal impedances differ by less than 3°, indicating one-dimensionality. In the Coast Range, the deep geo-electric strike abruptly changes from N30°W to N30°E to the east, where, however, conductivity mostly varies with depth (see Figure 3). Note that there is a 90° ambiguity in magnetotelluric strike analyses.

Figure DR2: In phase (real, black) and out of phase (imaginary, gray) induction vectors illustrating lateral conductivity contrasts. In the Wiese convention used here, arrows point away from conductors.

Figure DR3: Resolution study for the model in Figure 3 (‘model 0’). This model was edited, setting the resistivities of structures ‘A’ and ‘C’ (red rectangles) to a uniform 1000 Ωm (models I’ & II’, not shown). Results of inversions that use these models as starting models and keep the edited region fixed are shown above. In each case, the inversion attempts to accommodate the change by decreasing resistivities below and east (model I) or above (model II) the edited areas. Above the areas of investigation, the normalized data misfit (rms) increases from 1.75 (model 0) to 1.95 (model I) for sites 9-18 in the forearc, and from 1.41 to 1.52 (model II) for the 13 easternmost sites. An identical investigation showed that also 300 Ωm is a too high resistivity for both structures, with subset data misfits of 1.83 and 1.47, respectively. The failure to regain the original fit to the data indicates that structures ‘A’ and ‘C’ are required by the data. Setting the structure resistivity to a uniform 100 Ωm in this procedure gives a just slightly better set data fit for structure ‘A’ (rms=1.82), while for structure ‘B’, set fit is close to the one from the unconstrained inversion of Figure 3 (rms=1.41).
Soyer and Unsworth, Figure DR1, EPS
Period: 100 sec

Period: 2500 sec

Soyer and Unsworth, Figure DR2, EPS
Soyer and Unsworth, Figure DR3, EPS